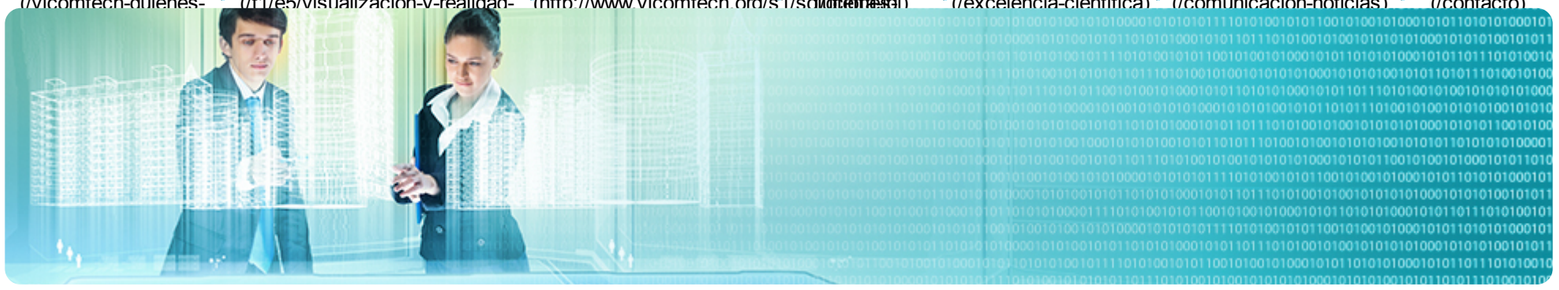

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Hardware-accelerated Web Visualization of Vector Fields. Case Study in Oceanic Currents

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Visualization of vector fields plays an important role in research activities nowadays. Increasing web applications allow a fast, multi-platform and multi-device access to data. As a result, web applications must be optimized in order to be performed heterogeneously as well as on high-performance as on low capacity devices. This paper presents a hardware-accelerated scheme for integration-based flow visualization techniques, based on a hierarchical integration procedure which reduces the computational effort of the algorithm from linear to logarithmic, compared to serial integration methodologies. The contribution relies on the fact that the optimization is only implemented using the graphics application programming interface (API), instead of requiring additional APIs or plug-ins. This is achieved by using images as data storing elements instead of graphical information matrices. A case study in oceanic currents is implemented.
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